Space Weather Forecast

Issued on Saturday, 10 August 2024 at 13:18 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further Moderate-class flares expected with a chance of isolated Strong flares. Occasional Minor to moderate geomagnetic storms likely, mainly today and tomorrow (10-11 Aug) with a reduced chance on Days 3-4 (12-13 Aug).

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate with multiple Moderate-class flares observed in the past 24 hours. The Earth facing side of the Sun currently has nine numbered sunspot regions, and two as yet unnumbered regions. A large number of these regions are magnetically complex or very complex, especially one impressive region that is currently at centre disc. Most of the flare activity of the period originated from these complex or very complex groups, although one simpler region also contributed.

The largest moderate flare on 09 Aug produced a Coronal Mass Ejection (CME), with analysis suggesting an arrival time at Earth for late Day 3 (12 Aug) or more likely early Day 4 (13 Aug). Another moderate flare on early on 10 Aug also produced a CME, with analysis awaited for any Earth-directed component.

Solar Wind / Geomagnetic Activity: Slow wind conditions mostly persisted through the period, although wind speeds did touch slightly elevated levels at times. Interplanetary Magnetic Field was weak while the north-south component was also weak and variable in direction. Geomagnetic activity was Quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Moderate to High solar activity is forecast, with occasional Moderate-class flares expected and a chance of isolated Strong-class flares.

Solar Wind /Geomagnetic Activity: There is potential for multiple CMEs to arrive today (10 Aug), but confidence remains low due to complicated analysis. Additionally, a CME associated with the Strong flare on the 8th, may arrive at Earth later Day 2 (11 Aug). A CME from a Moderate class flare on the 9th is also forecast to have an Earth-directed component, with an arrival late on Day 3 (12 Aug) or more likely early Day 4 (13 Aug).

CME influence is likely at times throughout the forecast period, however overall confidence in the CME forecast is low. Geomagnetic activity is expected to be mostly Quiet (Kp1-2) in the absence of any CME arrivals, with a slight chance of isolated Unsettled intervals (Kp3). For Days 1-2 (10-11 Aug) occasional G1-G2/Minor to Moderate Storming (Kp5-6) intervals are likely in association with CME arrivals, with a slight chance of G3/Strong (Kp7) storms. This risk decreases slightly going into Days 3-4 (12-13 Aug), but further CME arrivals remain likely.

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Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist around background levels, but with a chance of further enhancement given the occurrence of any notable flares. This gives a slight chance of reaching or exceeding the Minor Radiation Storm level.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	70	70	40	40
Strong	G3	No	15	15	5	5
Severe	G4	No	1	2	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	80	80	80
Very Active	R3 to R5 X	No	20	20	20	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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